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FACTORS AFFECTING THE FLAT ROOF'S PERFORMANCE OF EDUCATIONAL BUILDING IN PERAK TENGAH

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ABSTRACT

In recent years, many educational buildings in Malaysia had been using flat roofs rather than traditional pitched roofs due to the overall appearance of the building structure. Mouldy roofs, cracks, and waterproofing damage were the most common problems issuing to flat roofs. Currently, many educational buildings are facing this kind of problem. Moreover, the leaking from the flat roof will enter the faculty building and causes issues for lecturers and students. Thus, it gave a bad visual appearance to the building. Due to this scenario, the aim of this research is mainly focused on the performance of flat roofs in the educational building with three research objectives; To identify the factors affecting performance of flat roof in educational building. To determine the types of flat roof defects in educational building. To suggest ways to prevent flat roof defects from occur in educational building. Apart from that, it also suggests ways to prevent flat roof defects from occurring in the educational building in Perak Tengah. The method used was the quantitative method by distributing a questionnaire survey to the contractor organizations who have experienced in constructing or repairing flat roofs and registered under CIDB with licensing ranged from G2 to G7. The research showed that the factors affecting the performance of flat roofs were weather, workmanship, quality of material, design, maintenance, and usage of flat roofs. From the research also it can be concluded that flat roof should be carefully planned and constructed so that their functions may be optimized and sustained throughout time, especially in tropical conditions like Malaysia.

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CHAPTER 1

INTRODUCTION

1.1 Background of research

Flat roofs are typically constructed by layering insulating and waterproofing materials over the roof's structural framework. Flat roofs, despite their name, are not entirely flat. They must have a slight incline to ensure proper water drainage (Andenaes, Engebo, Kvande, Bohne and Lohne, 2019). According to Asmawan, Nasrun, Adi, and Elis (2015), typically, they are built to have a minimum fall of 1:40, which could result in a minimum fall of at least 1:80 in the finished construction due to on-site discrepancies.

In comparison to a pitched roof, a flat roof receives more direct sunlight during the day. They were thought to be a more cost-effective alternative to conventional pitched roofs. However, frequent maintenance is required as Malaysia is one of a tropical climate country. In recent year, many educational buildings in Perak Tengah are using flat roof rather than pitched roof due to overall appearance of the building structure. The list of educational buildings in Perak Tengah is showed in Chapter 3.

A flat roof has many mechanically waterproof layers, which ensures that if water reaches the assembly through a crack, it can be difficult to escape and may flow horizontally for long distances before reaching the layer below. In tropical climates such as Malaysia, surface-related defects, damage to the waterproofing membrane, and cracks in the roof parapet wall are typical roof construction defects that need routine maintenance due to hot and humid conditions throughout the year which according to Asmawan et al. (2015), Malaysia is relatively high mean annual rainfall depth of 250 cm yearly and a relative humidity of 27°C.